Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) Apparatus for transferring information within a cellular network, comprising:

a base-station transceiver system (BTS) (24A) positioned at a first location, which comprises:

communication control circuitry (25A), adapted to generate down-link radio-frequency (RF) signals receivable by a mobile cellular transceiver (48) operative within the cellular network and to process up-link RF signals transmitted, by the mobile cellular transceiver; and

first transducer circuitry (27A), adapted to modulate a first beam of unguided ~~electromagnetic~~ optical radiation with the down-link RF signals and to radiate the modulated beam as a first modulated optical beam, and to receive and demodulate a second modulated beam of unguided ~~electromagnetic~~ optical radiation to as to recover the up-link RF signals; and

an antenna assembly (26A), positioned at a second location remote from the first location, which comprises:

second transducer circuitry (29A), adapted to modulate a second beam of unguided ~~electromagnetic~~ optical radiation with the up-link RF signals and to radiate the modulated beam as the second modulated optical beam to the BTS, and to receive and demodulate the first modulated beam of unguided ~~electromagnetic~~ optical radiation from the BTS so as to recover the down-link RF signals; and

an antenna (31A), adapted to radiate the recovered down-link RF signals to the mobile cellular transceiver and to receive the up-link RF signals from the mobile cellular transceiver.

2. (Currently Amended) Apparatus according to claim 1, wherein the first and the second transducer circuitry are adapted to radiate the first modulated optical beam and the second modulated optical beam via a path between the BTS and the antenna comprising free space.

3. (Currently Amended) Apparatus according to claim 1, wherein at least one of the first and second transducer circuitry comprises a laser which transmits coherent optical radiation as the unguided ~~electromagnetic~~ optical radiation between the BTS and the antenna.

4. (Currently Amended) Apparatus according to claim 1, wherein at least one of the first and second transducer circuitry comprises at least one emitter which transmits incoherent optical radiation as the unguided ~~electromagnetic~~ optical radiation between the BTS and the antenna.

5. (Original) Apparatus according to claim 1, wherein the first location is separated from the second location by a distance chosen from a range between approximately 10 m and approximately 700 m.

6. (Original) Apparatus according to claim 1, wherein at least one of the first and second beams comprises electromagnetic radiation having a wavelength chosen from a range between approximately 0.3 um and approximately 30 um.

7. (Original) Apparatus according to claim 1, wherein at least one of the first and second beams comprises electromagnetic radiation having a wavelength chosen from a range between approximately 1 mm and approximately 30 cm.

8. (Original) Apparatus according to claim 1, and comprising a switching center which is adapted to generate the information responsive to the up-link and down-link signals and to transfer the information between the BTS and at least one communication system chosen from a group comprising a public switched telephone network (PSTN), a distributed packet transfer network, a satellite communications system, and a second cellular network.

9. (Original) Apparatus according to claim 1, and comprising a base-station controller (BSC) which controls the BTS.

10. (Original) Apparatus according to claim 1, wherein at least one of the down-link RF signals and the up-link RF signals comprise a plurality of separate RF signals.

11. (Original) Apparatus according to claim 1, wherein the first transducer circuitry comprises an analog-to-digital converter which is adapted to digitize the down-link RF signals so as to generate down-link digitized signals, and wherein the second transducer circuitry comprises a digital-to-analog converter which is adapted to recover the down-link RF signals from the down-link digitized signals.

12. (Original) Apparatus according to claim 11, wherein the first transducer circuitry is adapted to compress the down-link digitized signals so as to generate compressed down-link digital signals, and wherein the second transducer circuitry is adapted to decompress the compressed down-link digital signals so as to recover the down-link digitized signals.

13. (Original) Apparatus according to claim 1, wherein the second transducer circuitry comprises an analog-to-digital converter which is adapted to digitize the up-link RF signals so as to generate up-link digitized signals, and wherein the first transducer circuitry comprises a digital-to-analog converter which is adapted to recover the up-link RF signals from the up-link digitized signals.

14. (Original) Apparatus according to claim 13, wherein the second transducer circuitry is adapted to compress the up-link digitized signals so as to generate compressed up-link digital signals, and wherein the second transducer circuitry is adapted to decompress the compressed up-link digital signals so as to recover the up-link digitized signals.

15. (Currently Amended) A method for transferring information within a cellular network, comprising:

positioning a base-station transceiver system (BTS) (24A) at a first location;

generating in communication control circuitry (25A) comprised in the BTS down-link radio-frequency (RF) signals receivable by a mobile cellular transceiver (48) operative within the cellular network;

modulating a first beam of unguided ~~electromagnetic~~ optical radiation with the down-link RF signals in first transducer circuitry (27A) comprised in the BTS, so as to form a first modulated optical beam;

radiating the first modulated optical beam from the first transducer circuitry;

receiving and demodulating a second modulated beam of unguided ~~electromagnetic~~ optical radiation in the first transducer circuitry so as to recover up-link RF signals transmitted by the mobile cellular transceiver;

processing the up-link RF signals in the communication control circuitry;

positioning an antenna assembly (26A) at a second location remote from the first location;

receiving in an antenna (31A) comprised in the antenna assembly the up-link signals from the mobile cellular transceiver;

modulating a second beam of unguided ~~electromagnetic~~ optical radiation with the up-link RF signals in second transducer circuitry (29A) comprised in the antenna assembly, so as to form the second modulated optical beam;

radiating the second modulated optical beam from the second transducer circuitry to the BTS;

receiving and demodulating in the second transducer circuitry the first modulated optical beam from the first transducer circuitry so as to recover the down-link RF signals; and

radiating the recovered down-link RF signals from the antenna to the mobile cellular transceiver.

16. (Currently Amended) A method according to claim 15, wherein radiating the first modulated optical beam and radiating the second modulated optical beam comprises radiating the first and second optical beams via a path between the BTS and the antenna comprising free space.

17. (Currently Amended) A method according to claim 15, and comprising providing at least one laser which transmits coherent optical radiation as the unguided ~~electromagnetic~~ optical radiation between the BTS and the antenna.

18. (Currently Amended) A method according to claim 15, and comprising providing at least one emitter which transmits incoherent optical radiation as the unguided ~~electromagnetic~~ optical radiation between the BTS and the antenna.

19. (Original) A method according to claim 15, wherein the first location is separated from the second location by a distance chosen from a range between approximately 10 m and approximately 700 m.

20. (Currently Amended) A method according to claim 15, wherein at least one of the first and second beams comprises ~~electromagnetic~~ optical radiation having a wavelength chosen from a range between approximately 0.3 um and approximately 30 um.

21. (Currently Amended) A method according to claim 15, wherein at least one of the first and second beams comprises ~~electromagnetic~~ optical radiation having a wavelength chosen from a range between approximately 1 mm and approximately 30 cm.

22. (Currently Amended) A method according to claim 15, ~~and~~ comprising a switch center for generating the information responsive to the up-link and down-link signals and transferring the information between the BTS and at least one communication system chosen from a group comprising a public switched telephone network (PSTN), a distributed packet transfer network, a satellite communications system, and a second cellular network.

23. (Original) A method according to claim 15, and comprising controlling the BTS with a base-station controller (BSC).

24. (Original) A method according to claim 15, wherein at least one of the down-link RF signals and the up-link RF signals comprise a plurality of separate RF signals.

25. (Original) A method according to claim 15, and comprising:

digitizing the down-link RF signals in an analog-to-digital converter comprised in the first transducer circuitry so as to generate down-link digitized signals, and

recovering the down-link RF signals from the down-link digitized signals in a digital-to-analog converter comprised in the second transducer circuitry.

26. (Original) A method according to claim 25, and comprising:

compressing the down-link digitized signals in the first transducer circuitry so as to generate compressed down-link digital signals; and

decompressing the compressed down-link digital signals in the second transducer circuitry so as to recover the down-link digitized signals.

27. (Original) A method according to claim 15, and comprising:

digitizing the up-link RF signals in an analog-to-digital converter comprised in the second transducer circuitry so as to generate up-link digitized signals, and

recovering the up-link RF signals from the up-link digitized signals in a digital-to-analog converter comprised in the first transducer circuitry.

28. (Original) A method according to claim 27, and comprising:

compressing the up-link digitized signals in the second transducer circuitry so as to generate compressed up-link digital signals; and

decompressing the compressed up-link digital signals in the first transducer circuitry so as to recover the up-link digitized signals.

29. (New) The apparatus according to claim 1, wherein the communication control circuitry is disposed solely within the base-station transceiver system.

30. (New) The apparatus according to claim 1, wherein there is one base-station transceiver system for each remote antenna assembly.

31. (New) The method according to claim 15, further comprising providing the communication control circuitry solely within the BTS.

32. (New) The method according to claim 15, further comprising providing one BTS per antenna assembly.